Acinetobacter:

Guidelines and Measures to Control and Treat Outbreaks of Acinetobacter

LCDR Kyle Petersen DO, FACP

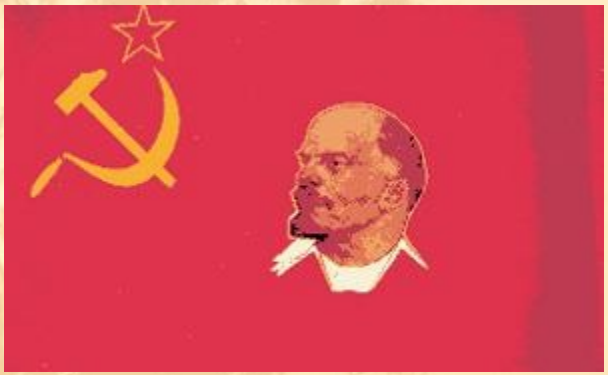
NNMC, Bethesda, MD

Objectives:

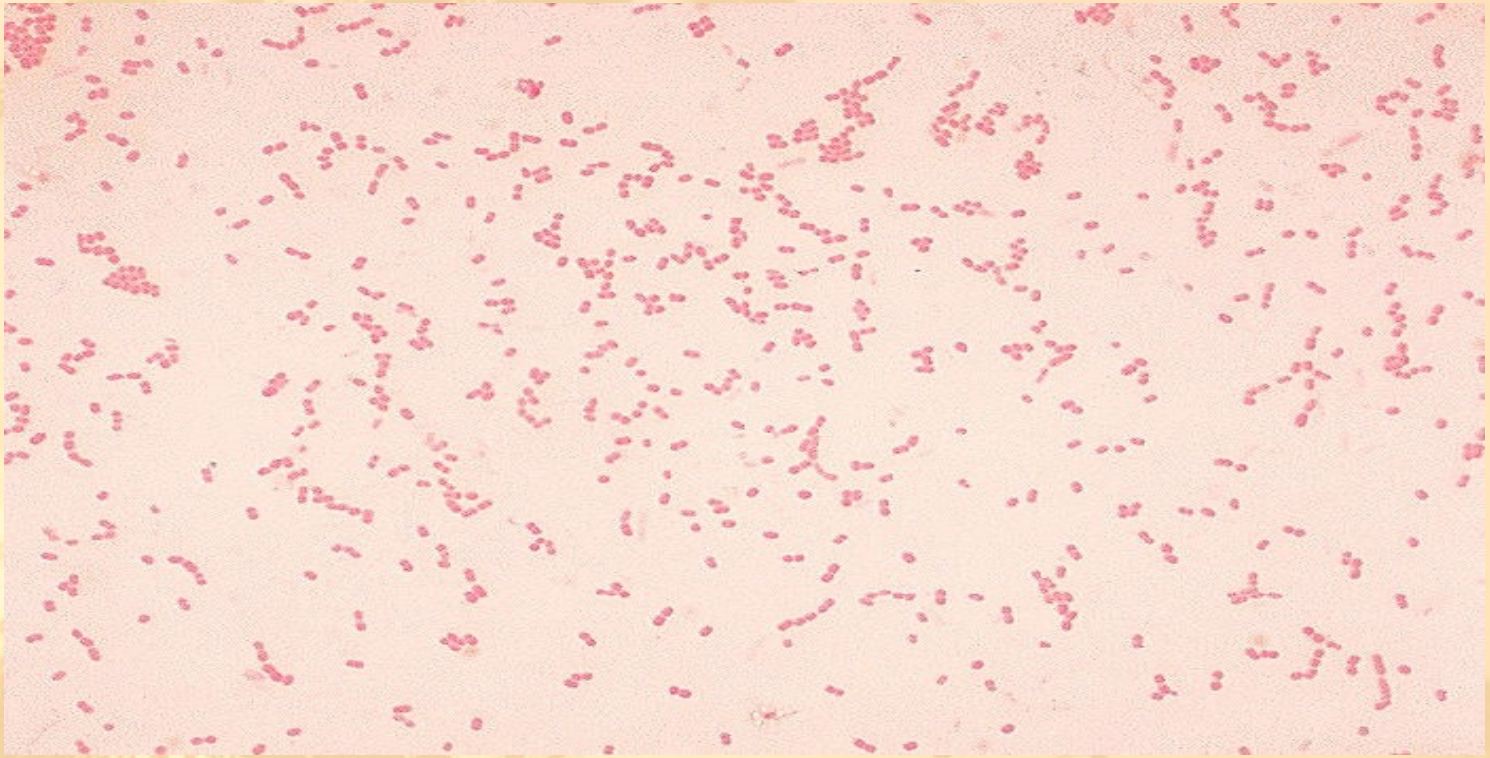
- Understand Hx of *Acinetobacter* spp.
- Understand epidemiology of AB
- Understand methods of AB screening and prevention
- Understand treatment and prophylaxis for AB

Old Red Menace

THE MOST TALKED ABOUT DRAMA OF OUR TIME
THE RED MENACE
SO SHOCKING IT WAS FILMED BEHIND LOCKED STUDIO DOORS
A REPUBLIC PICTURE



New Red Menace



Acinetobacter background

- Non-motile gram negative coccobacillus
- Often mistaken for staph on bad gram stain
- A colonizer of skin & mucosa in the tropics, but not temperate climates
- Increased cases in summer perhaps biofilm bloom in tapwater

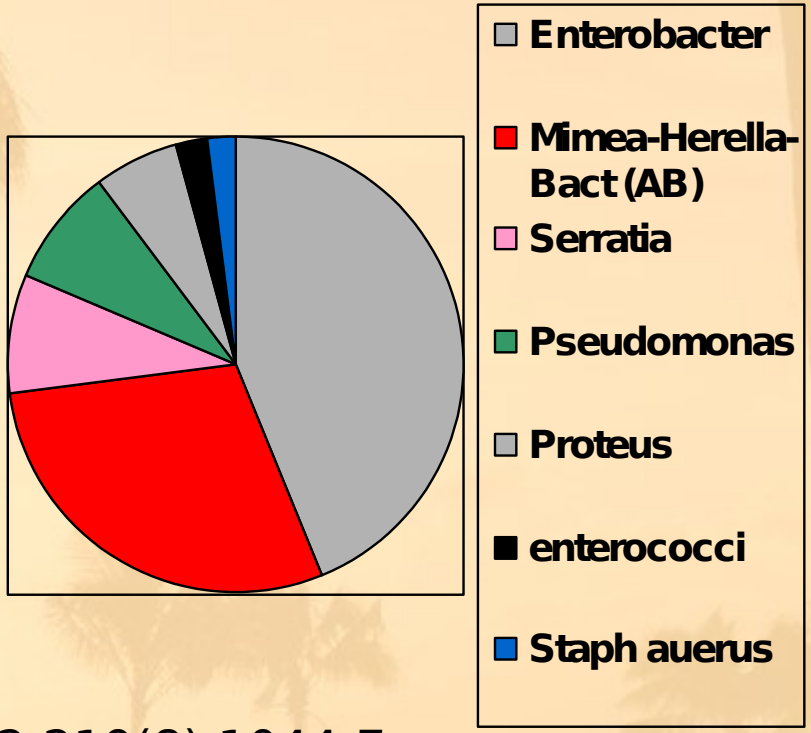
Acinetobacter background

- Acinetobacter baumanii and lwolffii most commonly isolated in human disease
- Common Nosocomial pathogen
- VAP, Burn infections, UTI, sepsis
- Very difficult to eradicate on surfaces
- What about combat /trauma victims?

Acinetobacter history

Bloodstream isolates by species

- Vietnam era
- Study of wound infections at DaNang 1968-1969
- 30 patients 63 extremity wounds
- 12 patients with 43 positive blood cx
- Eight blood and wound cx correlated

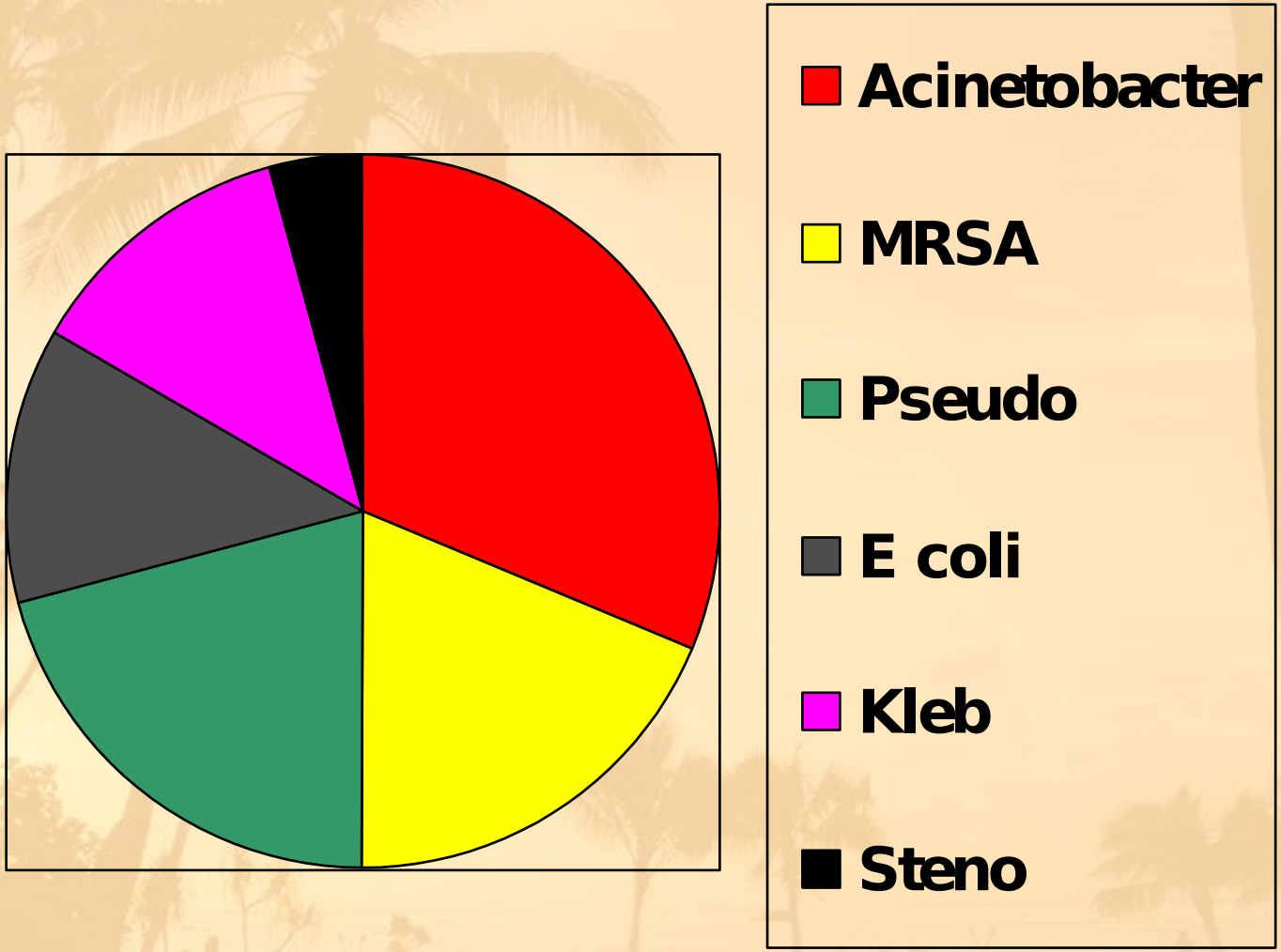


Tong: JAMA1972:219(8) 1044-7

Marmara Earthquake 1997

- 532 Patients admitted to Turkish hospital
- Crush, trauma injuries
- Delayed access to care trapped under rubble
- 18% got nosocomial infection
- 31% of those were Acinetobacter

Marmara earthquake 1997



Bali bombings 10/02/02

>200 dead 400 injured

35 patients medevac Perth Australia 2d later

Burn blast crush injuries

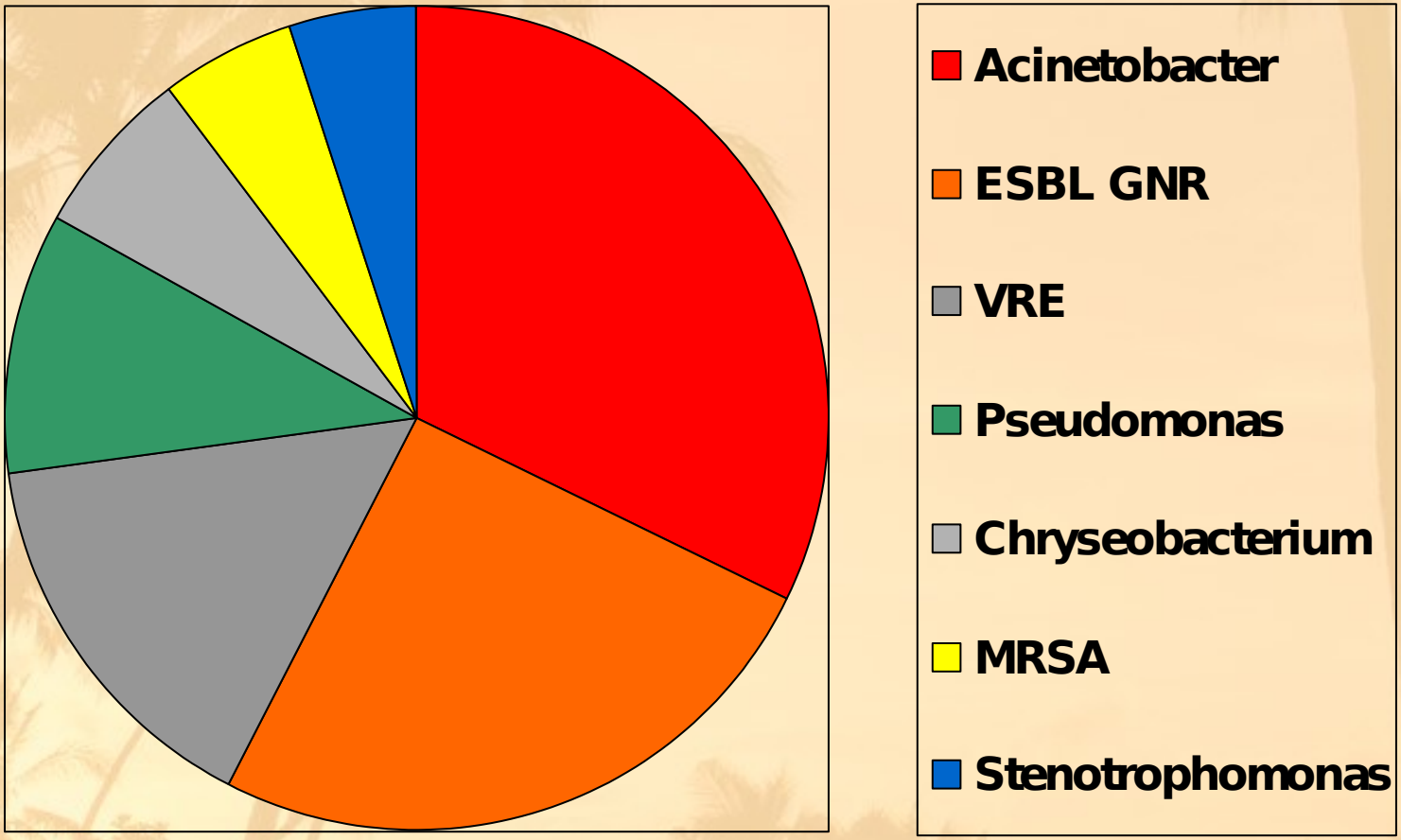
- IV Cephalothin in Bali

Bali bombings 10/02/02

- 29 Admits 82% colonized with MDRO
- 19 patients (65%) AB infection
- 3 pts (10%) AB sepsis
- 8 pts (non-Bali) acquired nosocomial AB infection
- Most isolates R to everything except carbapenems and colistin

Heath: Austral Infect Control 2003:8(2) 43-54

Positive patient cultures by species Bali bombing victims 2002



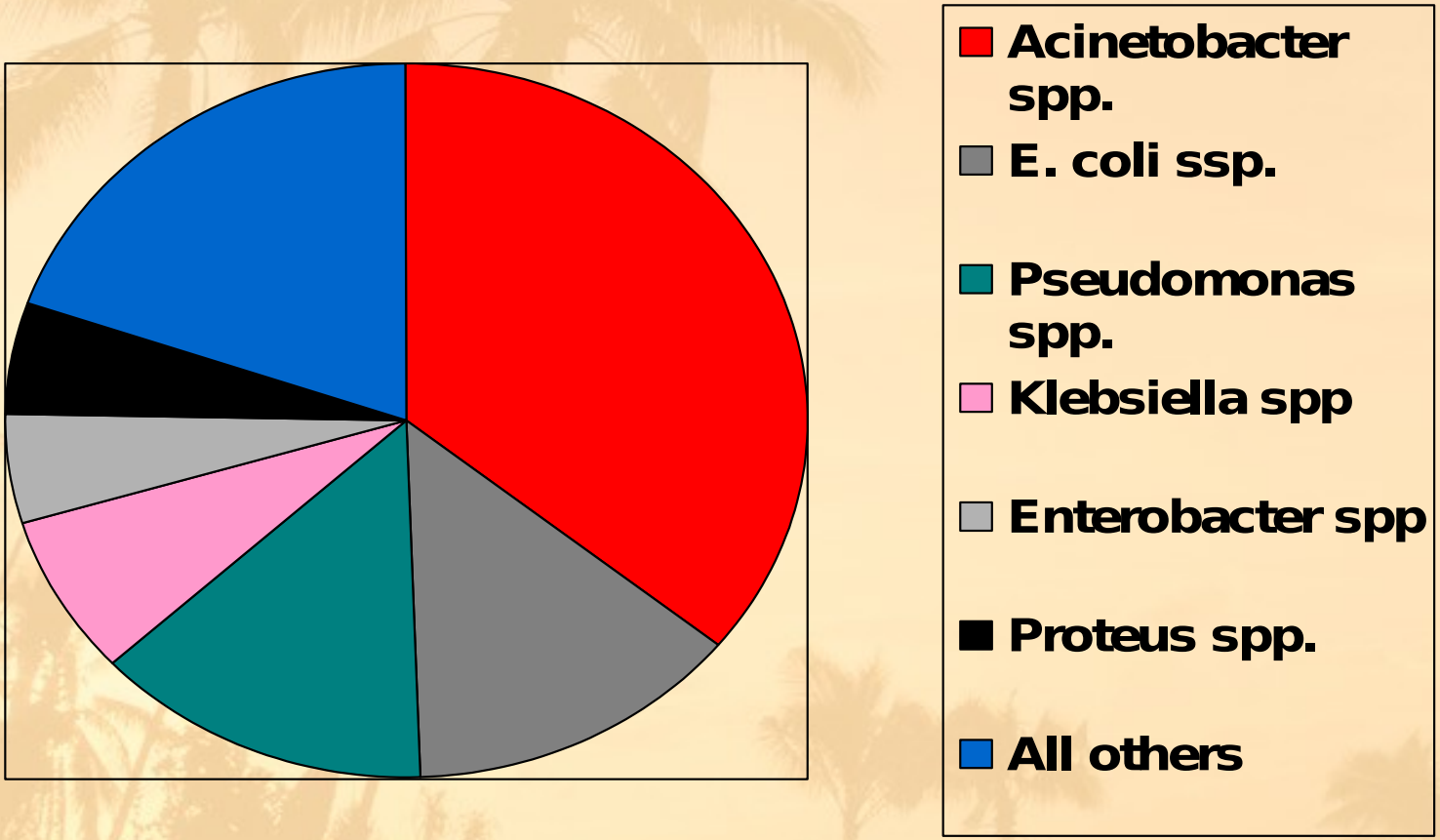
Heath: Austral Infect Control 2003:8(2) 43-54

Outbreak Data USNS COMFORT 2003

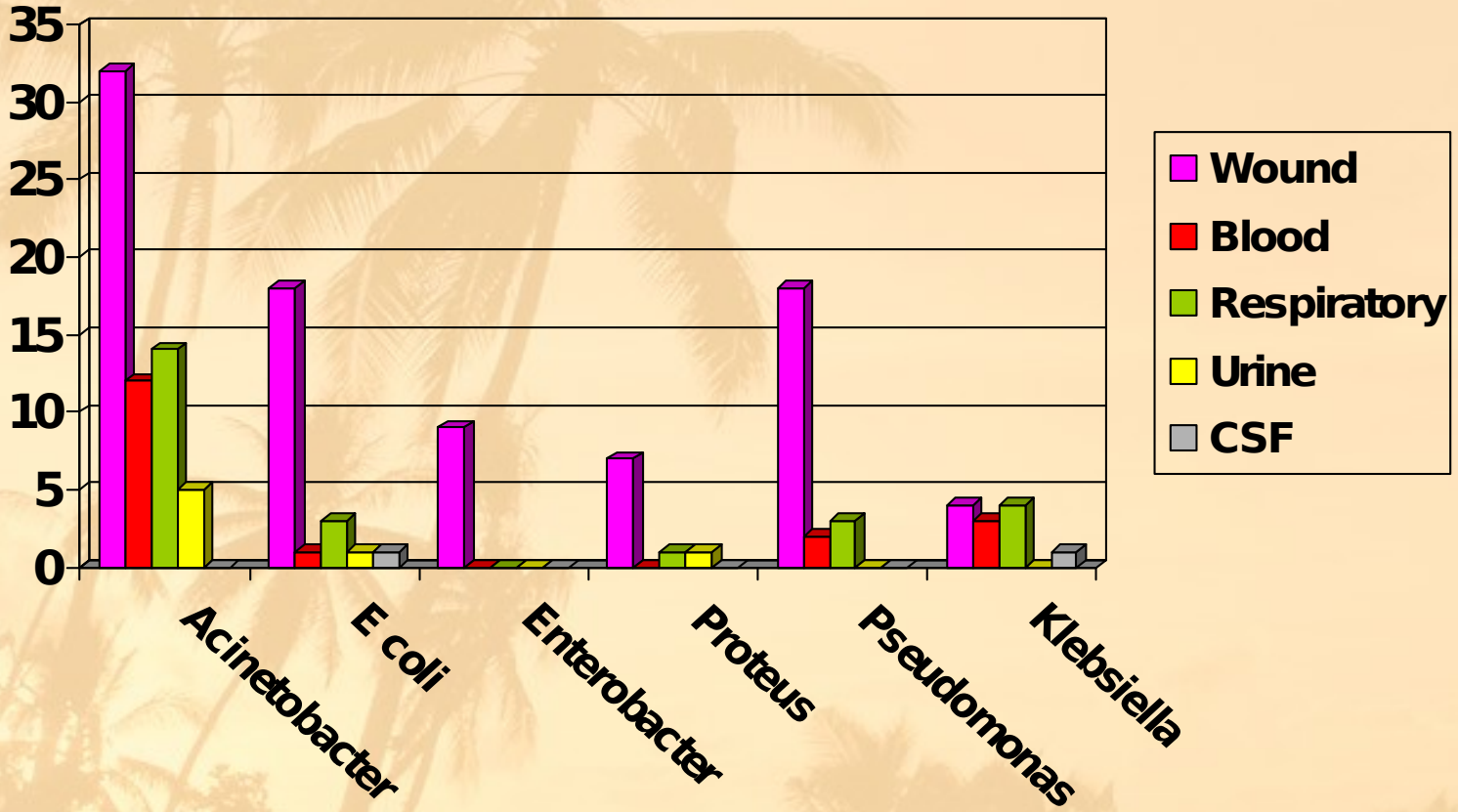
- 48/211 WIA cases 23% infected or colonized with MDR acinetobacter (wound, sputum, urine, blood)
- Majority pos. Cultures early in hospitalization-suggesting outside source, not nosocomial
- Majority of isolates are multi-drug resistant (S to imipenem +/- amikacin only)

Post- mortem

Most common organisms isolated from wounded patients USNS COMFORT



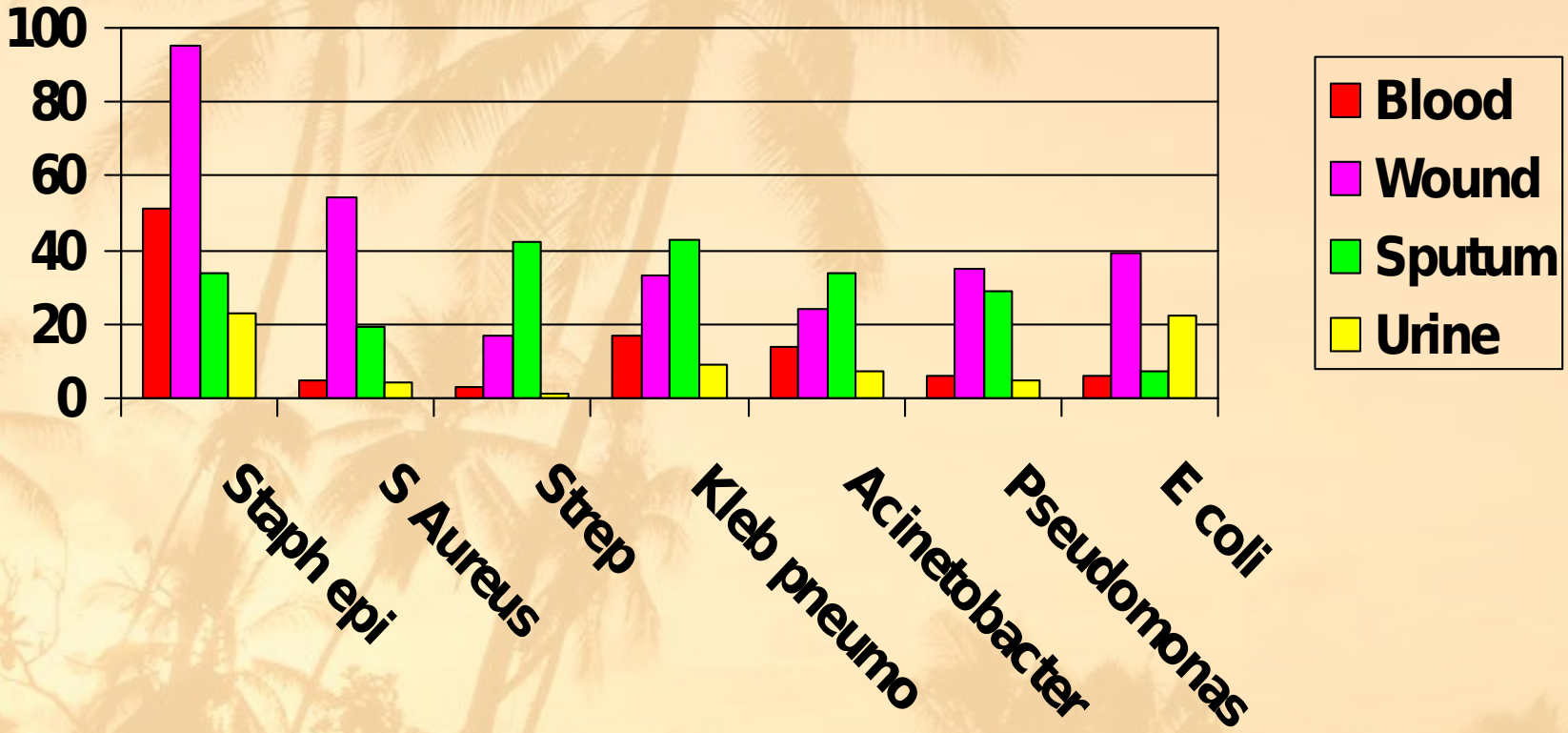
Comparison of isolation site for 5 most common organisms by culture site USNS COMFORT



Why so much acinetobacter?

- 80% of our patients were Iraqis
- Likely in the dirt in Iraq
- Has a propensity to colonize oropharynx in 7% of persons residing in the tropics
- Lice? La Scola et. al. “Detection and Culture of *Bartonella quintana*, *Serratia marcesens* and *Acinetobacter* spp. From decontaminated body lice” J Clin Micro. 2001 39: 1707-09
  - 11 patients, 161 Lice, 6.2% grew >1000 CFU of *Acinetobacter* spp.
  - Suggests lice may transmit this infection

Culture results by type admitted to Army CSH



Why so much acinetobacter?

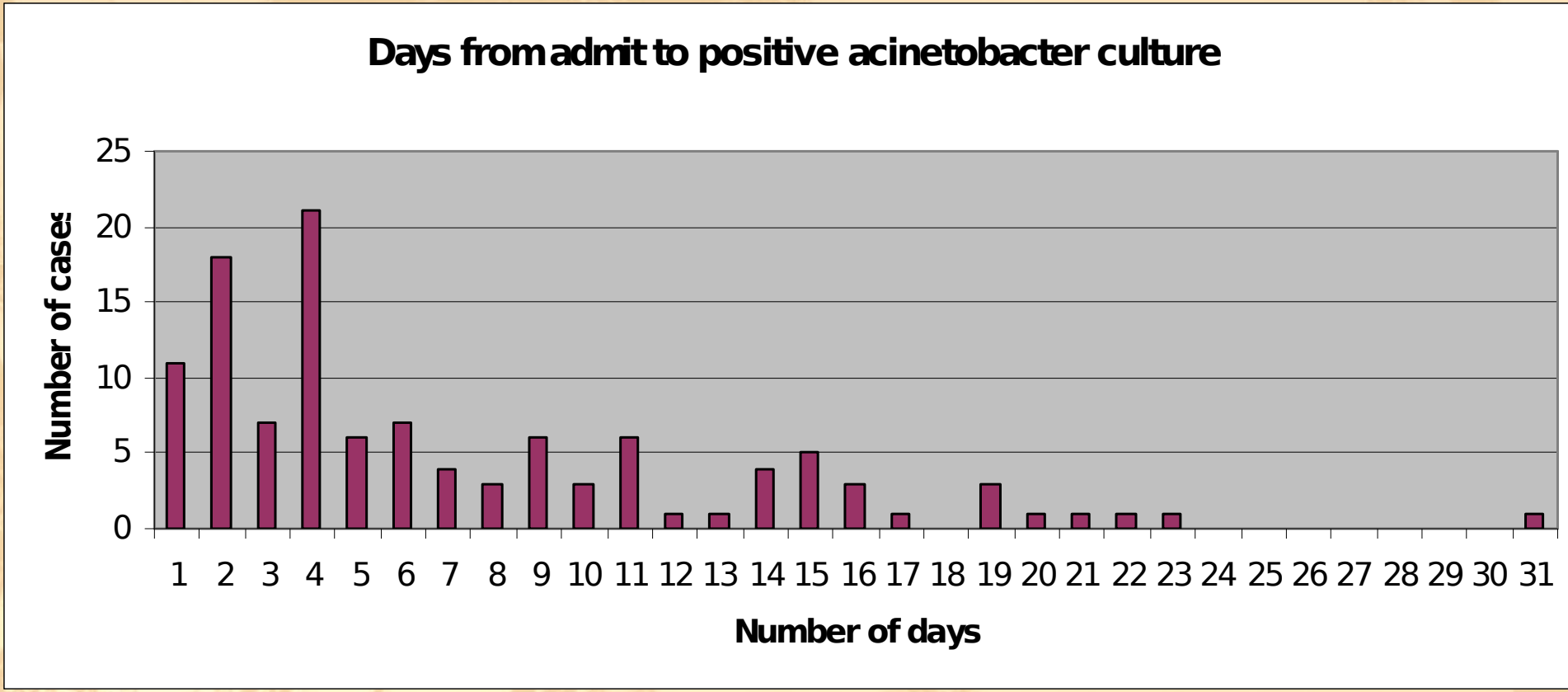
- Normal flora are destroyed when peri-operative Ancef etc given
- Opportunist-infects wounds where tissue O2 is low, blood and lymph is disrupted decreasing immunity
- Cross contamination of US troops by Iraqis
- Once it established in the medevac chain, it is very hard to eradicate.

Infection Control

Failure on USNS COMFORT?

- Lack of hand hygiene products and sinks
- Shortage of gowns
- Repeated shortages of antibiotics
- Cohorting of patients to achieve infection control
- **Retroactive** vs. **proactive**
  - Wait for lab positives rather than up front isolation

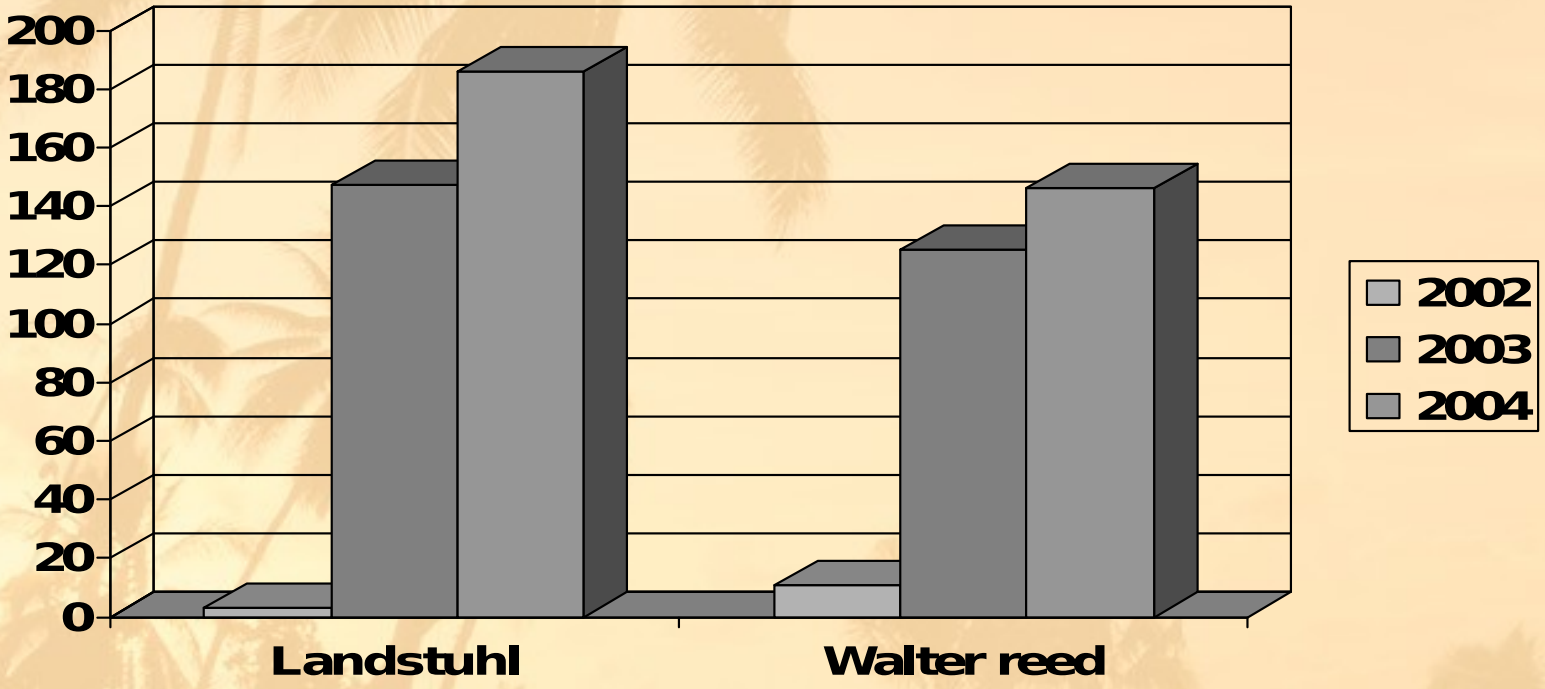
NAVY

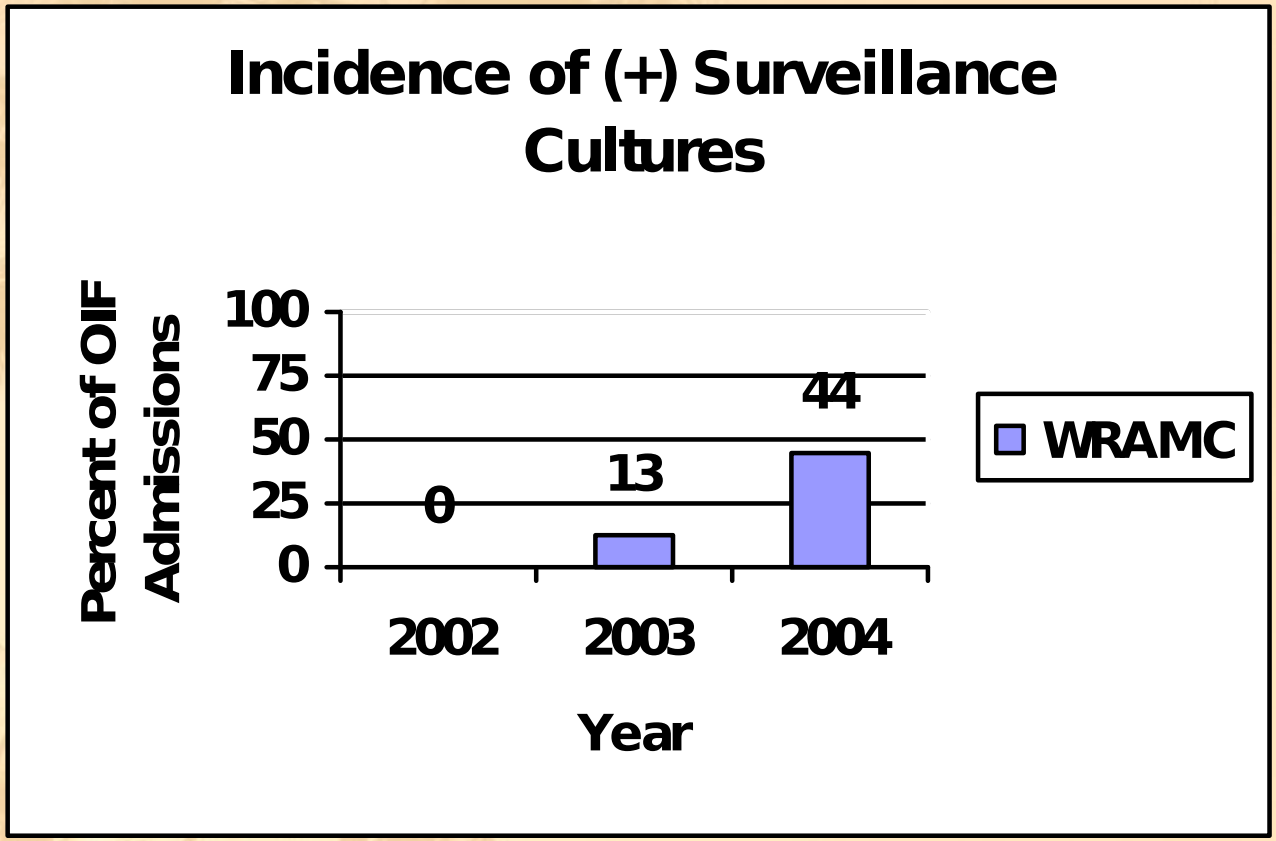

Days from admit to positive acinetobacter culture
Number of cases
25
20
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
Number of days

What about NNMC

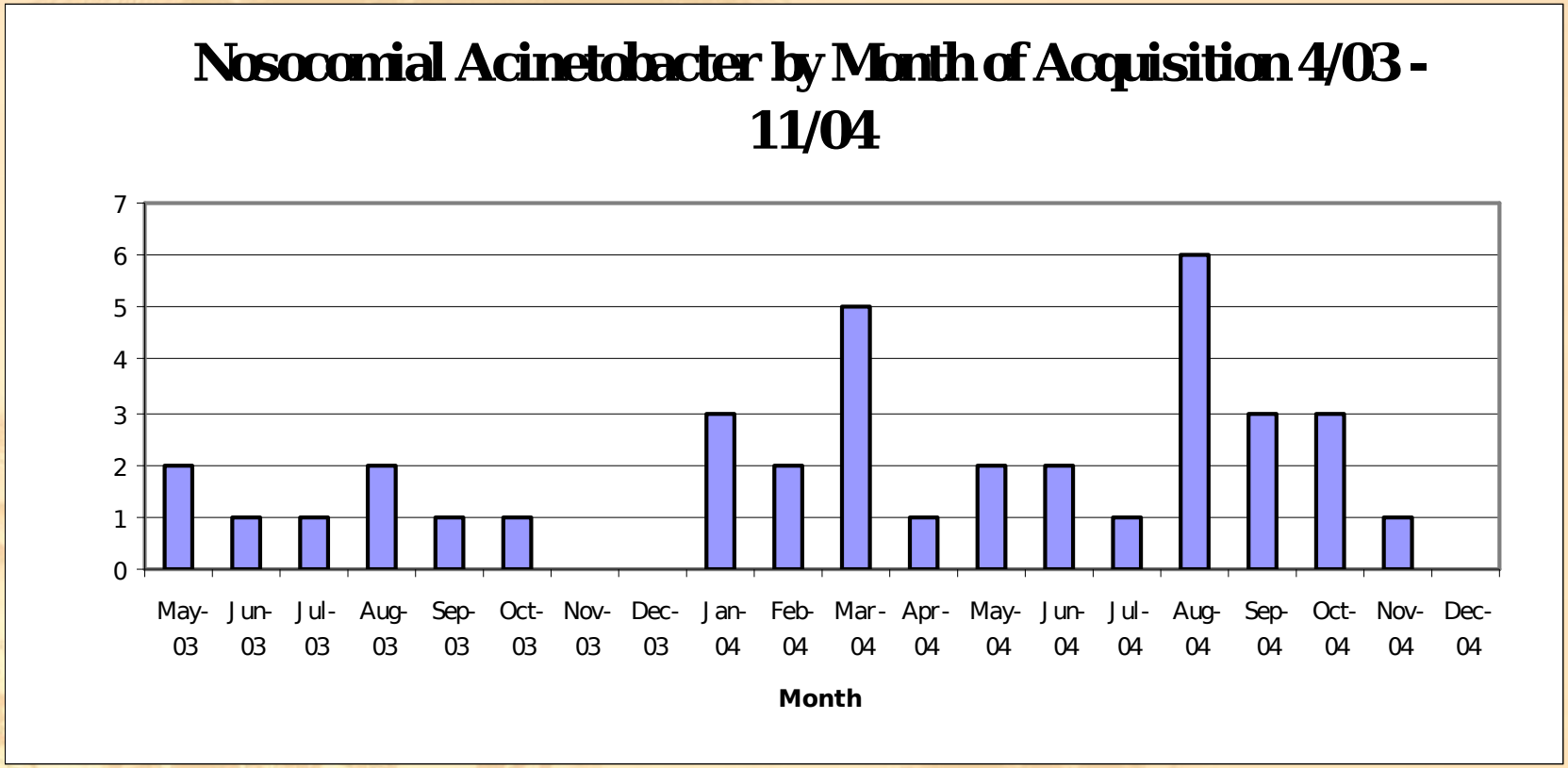
- NNMC Bethesda 5/03-2/05
  - 396 WIA admissions
  - 119 positive for Acinetobacter (30% of admits need isolation)
  - 2 nosocomial cases 1 death

Army data total AB cases




Incidence of (+) Surveillance Cultures
Percent of OIF Admissions
100
75
50
25
0
0
13
44
2002
2003
2004
Year
WRAMC

NOSOCOMIAL TRANSMISSION



WRAMC NOSOCOMIAL TRANSMISSION

Civilians	25
OIF/OEF	9
AD non-OIF/OEF	5
Total	**39**

What isolation for GNRs?

- Not described in literature (MRSA only)
- No clear APIC, SHEA etc guidelines
- MDR Pseudomonas clearly not transmitted person/person
- MDR Acinetobacter-strong evidence of person-person and surfaces
- MDR ESBLs-Jury is still out

Acinetobacter measures

- Very hard to eliminate (lives on surfaces for over 48 hrs)
- Often is multi-drug resistant so acquisition is hard to treat
- Persistence on human host is unknown (1-176 days in 1 recent abstract)
- High level decontamination and or shut down infected units
- Enforce hand washing

Acinetobacter measures

- Institute barrier precautions essential
- Cohort patients
- Random cx of provider’s hands?
- Polymyxin B or other topicals?
- Chlorhexidine?
- Study underway at WRAMC to investigate eradication

Table 2. Methods used to control nosocomial *Acinetobacter baumannii* infection at New York Hospital Queens.

Daily review of antibiotic susceptibility of all clinical isolates
Select ceftazidime or cefepime- or carbapenem-resistant isolates (eliminate duplicates from the same patient)
Review patient records prospectively to determine geographic location, nosocomial acquisition, and presence of clinical infection
Emphasize contact precautions to prevent transmission of isolates
Assign a dedicated infection-control nurse to affected area or areas
Cohort colonized and infected patients
Make alcohol-based soaps readily accessible
Enforce personnel hand washing by periodic culturing of hand samples
Use polymyxin B to selectively decontaminate colonized wounds
Consider inhaled polymyxin B for pulmonary colonization or infection (to supplement parenteral therapy)
Use surveillance techniques to monitor personnel, equipment, and environmental contamination
Instruct housekeeping to decontaminate the inanimate environment on a regular schedule
Close contaminated unit if necessary
Use molecular epidemiologic techniques to determine clonality of isolates
Educate personnel on a continuous basis
Provide surveillance results and infection rates in a timely manner to medical and surgical staff
Provide ready access of infection-control staff to medical personnel, patients, and families for questions

NNMC success over other institutions?

- Isolation on admission
- Cx of Nares axilla & wound
- Remove when cx are negative
- Contact precautions-gowns, gloves for all
- Droplet when pt identified with positive sputum
- Cohort patients when possible

Summary

- There are no clear guidance from “authorities”
- Outbreak data clearly shows rigorous IC measures are needed
- Ultimately units or wards might need closed for high level cleaning
- Dedicated IC assets are best
- Judicious antibiotic use and control of Cephalosporins and carbapenem abuse